

PATENT SPECIFICATION

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(21) Application No. 7392/75 (22) Filed 21 Feb. 1975

(31) Convention Application No.

7 408 624 (32) Filed 12 March 1974 in

(33) Federal Republic of Germany (DT)

(44) Complete Specification published 5 Oct. 1977

(51) INT. CL.² H01K 1/00 // 1/14 1/18

(52) Index at acceptance

H1F 2A1A 2A1C1 2A1H 2D2A 2D2X 2D8B 2E1CY

(19)



(54) HALOGEN INCANDESCENT LAMP

(71) We, PATENT-TREUHAND-GESELLSCHAFT FÜR ELEKTRISCHE GLÜHLAMPEN M.B.H., of 1, Hellabrunner Strasse, 8 München 90, Federal Republic of Germany, a German Body Corporate, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a halogen incandescent lamp, especially to a general service lamp. The halogen incandescent lamp comprises a tubular bulb of quartz glass or of another glass of high melting point having a single-ended pinch seal and lead-in wires pinched in it in the form of foil seals, and in which a coiled-coil filament of tungsten is held in M-shaped position by a girder mount, consisting of two long outer support wires and one short central support wire, all sealed into a quartz glass bridge. However, it was known that the coil of this filament construction was repeatedly prematurely destroyed by a short circuit particularly in the region of the supports. During the search for the cause of this, it was found that the turns of the filament are so closely spaced near the supports, that they can be bridged electrically by whiskers resulting from chemical transport reactions.

It is the aim of the present invention to provide a filament construction for these halogen incandescent lamps, which eliminates the danger of short circuit of the coil due to whisker growth, in order to achieve an extension of lamp life.

According to the invention there is provided a halogen incandescent lamp in which a filament is held in M-shaped position by a girder mount consisting of two long outer support wires and one short central support wire, wherein the filament consists of four coiled-coil segments and three single-coil segments, with the coiled-coil segments and

the single-coil segments arranged alternately, and with the filament supported in the single-coil segments by the support wires, the length of each single coil segment being greater than the diameter of the 50 coiled-coil segments.

Preferably, the length of the single-coil segments is $2\frac{1}{2}$ - $3\frac{1}{2}$ times the diameter of the coiled-coil filament. In this way a possible short-circuit between the turns, due to whisker growth near the heat conducting support wires, is reliably prevented.

In order that the invention and its various other features may be understood more easily, an embodiment thereof will now be described by way of example only with reference to the drawings, wherein:—

Figure 1 is a side elevation of a halogen incandescent lamp constructed in accordance with the invention;

Figure 2 shows detail Z of the halogen incandescent lamp shown in Figure 1.

The halogen incandescent lamp shown in Figure 1 comprises a bulb 1 of quartz glass or of another glass of high-melting point with a tip 3 at its dome. At the lower end the bulb 1 is closed by a pinch seal 2 into which the inner lead-in wires 5 are sealed and connected with the outer lead-in wires 10 by molybdenum foils 4. The inner lead-in wires 5 extend into the interior of the bulb and are passed through a bridge 8 of quartz glass. Two long outer support wires 6 and one short central support wire 7 are sealed into the bridge 8 of quartz glass and form a mount which serves to support a coiled-coil tungsten filament 9 in M-shaped position. The filament 9 consists of four coiled-coil segments 9a with interposed single-coil segments 9b. The length of the single-coil segments is $2\frac{1}{2}$ - $3\frac{1}{2}$ times the diameter of the coiled-coil filament.

Fig. 2 shows how, due to the single-coil segment 9b, the distance between the coiled-coil segments 9a becomes so large that even

when there is whisker growth a bridging of the turns and, consequently, short-circuiting is not possible any more. The whiskers resulting from chemical transport reactions, especially growing on segments with high temperature gradient, such as the place of filament support, due to the heat conduction of support 6, cannot lead to a short-circuit any more.

10 Instead of the described pinch seal 2 which is designed as wedge base and which is directly received in a socket, any other form of base may be used or the lamp may be mounted in a protective envelope.

15 WHAT WE CLAIM IS:—

1. A halogen incandescent lamp in which a filament is held in M-shaped position by a girder mount consisting of two long outer support wires and one short central support wire, wherein the filament consists of four

coiled-coil segments and three single-coil segments, with the coiled-coil segments and the single-coil segments arranged alternately, and with the filament supported in 25 the single-coil segments by the support wires, the length of each single coil segment being greater than the diameter of the coiled-coil segments.

2. A halogen incandescent lamp as 30 claimed in claim 1, wherein the length of the single-coil segments is $2\frac{1}{2}$ to 3 times the diameter of the coiled coil segments.

3. A halogen incandescent lamp substantially as described herein with reference 35 to the drawings.

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